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INTRODUCTION.

THESE Illustrations have been published with a view to giving to those Agriculturists who have not visited our Experimental Grounds some idea of our own special system of Plant Breeding which has been carried on by us for over a quarter of a century. The following illustrated details of the operations and processes necessary to raise and perfect New Breeds of Farm Plants, will, we think, be specially instructive to all those who are interested in Agriculture, and the many operations and developments which must necessarily take place at so many different periods of the year will convey to some extent the immense amount of time and labour that has to be expended upon this important work.

We have selected out of a very large number of photographs a few typical ones, which, in a general way, show the routine of the experimental work of the entire season, and, underneath each of these illustrations, short explanatory notes are given bearing upon the individual operations and processes which take place at these different periods. For those, however, who wish for further information we are preparing a detailed treatise dealing very fully with the whole subject of our experimental work, copies of which will be ready early in 1906.

Along with some of these illustrations will be found extracts of the opinions of the many prominent Agriculturists and Scientists from various countries who have visited our Grounds during the past few years. We are frequently asked by Farmers' Clubs and other similar bodies to give lectures upon our special system of Plant Breeding, and, as far as possible, we will be pleased to meet similar wishes by arranging for lectures (free of all charges) during the Winter and early Spring months. These lectures, which are fully illustrated by lime light pictures, are described in an easily understood manner, and will be found instructive and helpful to all those who are interested in progressive Agriculture.

*Agricultural Experiment Grounds,
Acton Grange, Warrington,
England, 1906.*



THE ARRIVAL OF A DEPUTATION OF REPRESENTATIVE AGRICULTURISTS FROM SHROPSHIRE
AT MESSRS. GARTONS EXPERIMENT GROUNDS.



DEMONSTRATING THE PRINCIPLES OF THE GARTON SYSTEM OF PLANT BREEDING TO A DEPUTATION, BEFORE
INSPECTING THE TRIAL PLOTS OF NEW BREEDS OF FARM PLANTS.



A PARTY OF AGRICULTURISTS EXAMINING THE SPECIAL CHARACTERS OF THE
NEW BREEDS OF GRASSES.



DEMONSTRATING TO A DEPUTATION OF AGRICULTURISTS THE SPECIAL CHARACTERS OF
"SELECTED INDIVIDUAL PLANTS" OF NEW BREEDS OF CLOVER.



REPRESENTATIVE AGRICULTURISTS FROM SHROPSHIRE INSPECTING THE NEW (FESCUE RYEGRASS)
BREEDS OF GRASSES.



INSPECTING THE FIELD TRIAL PLOTS OF NEW BREEDS OF CLOVERS.



EXAMINING THE SPECIAL CHARACTERS OF THE VARIOUS PLOTS OF
NEW BREEDS OF CLOVERS.



A PARTY INSPECTING FIELD TRIAL PLOTS OF NEW BREEDS OF WHEATS.



A PARTY OF AGRICULTURISTS EXAMINING THE SPECIAL CHARACTERS OF THE FIELD TRIAL
PLOTS OF NEW BREEDS OF CEREALS.



A PARTY OF AGRICULTURISTS INSPECTING A FIELD CROP OF ONE OF THE
NEW BREEDS OF GRAIN.



MEMBERS OF THE LIVERPOOL FARMERS' CLUB AT MESSRS. GARTONS
EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM CHESHIRE AND SHROPSHIRE AT
MESSRS. GARTONS EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM STAFFORDSHIRE AT MESSRS. GARTONS
EXPERIMENT GROUNDS.

A Plant-Breeding Establishment.

“**M**ESSRS. GARTONS have instituted at Newton-le-Willows, in Lancashire, an experimental farm, on which they have succeeded in producing some very remarkable developments in the culture of cereals. What they have aimed at, first of all, is that in crossing the plant it shall “sport” in all directions, and thus secure new but kindred types, some of which may yield abundant seed. In grasses, for instance, the most important new breeds produced have been by the combination of distinct species—notably the *Festuca* varieties with the varieties of ryegrass. The combination of these two species has resulted in new breeds being produced, of high agricultural value, which are likely to take a foremost place in our list of seeds. In clovers most valuable results have been obtained by combining the ordinary red clover with the wild red variety growing in old meadows or on railway embankments. The combination has produced a plant perfectly perennial in character, and with a much heavier yield. The first step was to ascertain whether natural cross-fertilization actually existed in the cereals. The method adopted was as follows:—A suitable number of heads of wheat were selected in a field crop, and the immature anthers were carefully removed from about half a dozen florets on each head, the remaining florets being left intact. The ovules in the florets from which the anthers had been removed had thus every opportunity to become fertilised by pollen either from the surrounding florets left intact upon the same heads or by pollen from outside sources. Not one single embryo was developed in the florets thus treated. This was considered sufficient evidence to justify the belief that natural cross-fertilisation did not exist. The results of these experiments with the wheat florets being accepted as conclusive, a wide field was opened for work directed towards the improvement, by means of artificial cross-fertilization, of nearly all forms of agricultural plants. From a single seed, hundreds of different types, perfectly distinct in form and character, were created season after season until the reaction set up through the medium of cross-fertilisation became exhausted by repeated sowings. No definite rule could be laid down as regarded the length of time the sportive tendency remained active, but, as a general rule, the nearer the relationship of the varieties which are combined, the shorter the period.”—*Vide “Standard,”* July 22nd.

Cross-bred Crops.

How the Farmer beats Nature by Art.

“THE latest and most daring experiment of modern agriculture was inspected the other day by a party of gentlemen from London, who found it well worth while to spend the whole sultry day in a railway carriage for the sake of one short hour on a farm at Newton-le-Willows. It is here that MESSRS. GARTON LIMITED have located the results of twenty years of research in a hitherto undiscovered domain of evolution.

They have done what no one else, except perhaps Major Hallett, has ever seriously thought of—they have actually bred wheat, oats, barley, and other field plants in order to produce the perfect type just as the stock farmer breeds animals. The significance of this is very strange. Nature has denied to cereals the opportunity of cross-fertilisation; Messrs. GARTON have artificially supplied and fostered it. And the results to-day are as startling as the theory was twenty years ago, when Mr. JOHN GARTON started to put it into practice.

A stock of wheat can be produced by cross-fertilisation which combines the best characteristics of wheats from all parts of the world. It is in very truth a new breed of wheat, and it is different from and better than any other by reason of increased yield, earlier maturity, and greater strength of straw. Oats and barley have similarly been bred to produce new and improved types. English barley has three grains to each spike; elaborately cross-fertilised on scientific methods, that very stalk produces a descendant with seventeen grains instead of three only to each spike. Breeding will do more; it will eliminate the husks of both barley and oats, and so increase their nutritive value, that these cereals may eventually supply “breakfast foods.”

These are new triumphs of evolution and artificial, not natural, selection which are actually accomplished by Messrs. GARTON. Their discovery should belong to the nation, for it was freely and unconditionally offered to the Government three times, but finally declined, not because it fails, but because there was no precedent to act upon.

Surely no precedent is necessary for a discovery like this, which could never be more important than it is to-day. It would double our home-grown cereal food supply, without either increased average or cost. That is proved by experiment to be its certainty; its possibilities seem infinite.”—*Vide “Daily Express,” July 30th.*



CROSSING TO PRODUCE NEW BREEDS OF OATS.



MARKING THE SELECTED PLANTS OF NEW BREEDS OF OATS.



SOWING THE SEED FROM SELECTED PLANTS OF NEW BREEDS OF OATS.



TRIAL ROWS FROM SELECTED PLANTS OF NEW BREEDS OF OATS.



TESTING NEW BREEDS OF OATS FOR YIELD, VIGOUR, AND QUALITY OF GRAIN.



TESTING NEW BREEDS OF WINTER OATS FOR YIELD, HARDINESS, AND QUALITY OF GRAIN.



SOWING SMALL TRIAL PLOTS OF GRAIN, TO TEST THE YIELD, VIGOUR, AND QUALITY OF GRAIN.



SMALL TRIAL PLOTS OF NEW BREEDS OF GRAIN.
TESTING FOR YIELD, DISEASE RESISTANCE AND QUALITY OF GRAIN.



TAKING NOTES OF THE CHARACTERS OF NEW BREEDS OF OATS DURING GROWTH.



FINAL FIELD TESTS OF NEW BREEDS OF OATS, FOR YIELD, VIGOUR, AND QUALITY OF GRAIN.



PICKING OUT MIXED PLANTS FROM STOCKS OF NEW BREEDS OF OATS BEFORE HARVESTING.



HARVESTING THE TRIALS OF THE SELECTED PLANTS OF NEW BREEDS OF CEREALS; EACH SHEAF BEING THE WHOLE PRODUCE OF A SELECTED PLANT.



HARVESTING THE SMALL TRIAL PLOTS OF NEW BREEDS OF CEREALS.



THRESHING WITH SPECIALLY CONSTRUCTED MACHINES NEW BREEDS OF WHEATS, OATS, AND BARLEYS.



HARVESTING A FIELD CROP OF A NEW BREED OF OAT, SHOWING THE METHOD OF TAKING OUT
ANY MIXED EARS BEFORE THE CROP IS CUT.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE AND CHESHIRE AT MESSRS. GARTONS EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE AND CHESHIRE, AT MESSRS. GARTONS EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM CHESHIRE AT MESSRS. GARTONS EXPERIMENT GROUNDS.

The Garton System of Plant-Breeding.

“ONE of the most interesting exhibits at both the Royal and Highland Shows this year was the stand of the Messrs. GARTONS. The chief object and attraction of wonderment was the system pursued by Mr. GARTON in the raising of these new varieties of seeds of different kinds, and with which the name of GARTON is indelibly associated. The *modus operandi* of the GARTON system is really the marrying together, as it were, of any variety of plant with another variety of the same species, and thus producing progeny or new breeds from the co-mingling of the plants. The experimenter claims to go even further than this upon the lines successfully pursued by pioneer stock-breeders, and by what he terms composite breeding, to perfect any qualification in which the progeny were deficient. The principle of the crossing process is not new, but it is obvious from the results that no one has developed the same degree of proficiency in the engrossingly interesting, but extremely intricate, and often disheartening work as Mr. GARTON has. As evidence of the tedious character of his task, it may be mentioned that it was only a few years ago that the fruits of his twenty years of arduous labours attained sufficiently defined results to justify him in bringing them before the public.”—*Vide "The Field,"* July 15.

Scottish Agriculturists at Gartons Experiment Grounds.

Describing the visit of a party of Agriculturists from Scotland, the *Dundee Advertiser*, of July 17th, says:—"A vast amount of valuable results was seen by the party on Friday. These included various stages in the evolution of wheat, barley, oats and grasses. To some the most interesting results were the cross bred plants from ryegrass and fescue, and the first cross between white turnips and swedes. Questioned in regard to self-crossing, Mr. JOHN GARTON, who is entitled to speak with unquestionable authority, said such was, to all intents, impossible. If self-crossing of allied types were even generally possible the result would be a constant form of "sporting" and chaos in the vegetable world. The crossing undertaken at Newton-le-Willows was all artificial—a most delicate operation done with fine instruments and by aid of the microscope. A fine result of crossing was to produce a strong tendency towards variation. The stronger and more distinct the types used in crossing, the more pronounced the tendency toward variation in results. Selection of desirable descendants from the crossing took years of patient effort and judgment, and absolute constancy could not be assured in the most violent crosses until a period of 12 to 15 years had passed."

Progressive Agriculture.

FOR many years the Royal Agricultural Society's Shows have been rendered more attractive by the splendid collections of seeds and plants brought together and displayed by the leading seed firms. There can be no doubt that British agriculture has been largely helped by these displays, for they have been the means of bringing before the million the advantages of employing good and well-selected seeds. Moreover, the freely-distributed guide books which our leading firms pour out in constant stream supply most valuable information, and have tended in no small degree to help to educate the farmer and gardener in matters on which it would have been difficult to obtain such reliable instruction. As one who has grown many hundred acres of selected seeds for various firms, I am in a position to state with what care their work is carried out; though those who have purchased their seeds do not need this confirmation, as the produce has well warranted the slight extra expense in obtaining fresh stocks. One can only regret that so many growers do not avail themselves of the enhanced profit that is derivable from the use of well-selected stocks; and only grow them when they have been passed from hand to hand through a number of years when the advantages of careful selection are lost. There are very few who do not admit the value of keeping well-bred animals; but this is by no means the case in respect to crops. This is more strange because there are few who do not recognise that a change of seed—even though no special care has been exercised in the selection of the seed—insures a greater profit. The trouble arising from ill-cleaned seeds is in itself a big one, and tends largely to the constant difficulty of keeping land clear. It is a matter of congratulation that the improvement of farm seeds is not likely to lapse; in fact, there is no doubt that an extraordinary stimulus has been introduced owing to the revelations made by the public announcement of the Gartonian methods of plant development.—*Vide "Salisbury Journal."*



CROSSING TO PRODUCE NEW BREEDS OF BARLEYS.



SOWING TRIAL PLOTS OF NEW BREEDS OF BARLEYS.



TRIAL ROWS FROM SELECTED PLANTS OF NEW BREEDS OF BARLEYS.



TESTING NEW BREEDS OF BARLEYS FOR YIELD, VIGOUR, AND QUALITY OF GRAIN.



TAKING NOTES OF THE EARLY GROWTH OF NEW BREEDS OF BARLEYS.



TESTING NEW BREEDS OF WINTER BARLEY FOR YIELD, HARDINESS, AND QUALITY OF GRAIN.



FINAL FIELD TESTS OF NEW BREEDS OF BARLEYS, FOR YIELD, VIGOUR, AND
QUALITY OF GRAIN.



HARVESTING A FIELD CROP OF A NEW BREED OF OAT, SHOWING OUR METHOD OF KEEPING PURE,
BY PICKING OUT THE MIXED EARS DURING HARVESTING OPERATIONS.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE, CHESHIRE, AND WORCESTERSHIRE, AT
MESSRS. GARTONS EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM CHESHIRE AT MESSRS. GARTONS EXPERIMENT GROUNDS.

Gartons Seed Grounds



“ON Thursday last (18th), a party of gentlemen, associated with scientific agriculture, and others journeyed to Newton-le-Willows (Lancashire) to see the seed trial grounds and experiment farm of Messrs. GARTONS, Warrington. The new dining car of the L. & N. W. Railway Company, which gained the Grand Prix at the Paris Exhibition, was used, and secured for the travellers the most easy and luxurious mode of transit, so that the long distance traversed was unnoticed.

The world has gained much during the past century from the improvements in seed and stock by careful attention to natural selection. This has almost led to human control over the survival of the fittest. But Messrs. GARTONS have gone much beyond this in directly intervening with the cross fertilisation of distinct species and genera. Human intelligence, trained up to a point beyond the speculations or even conceptions of Wallace and Darwin, has assumed the control of plants and compelled them to act according to order. Undesirable characteristics are made to disappear, desirable elements are put on or added, and, contrary to all previous scientific teaching on the question, whilst in the breaking down stage the variations are almost infinite, every feature which it is determined shall be conserved remains fixed.

This appears to many to be incredible, but all the same it is the fact, and it is conclusively proved by Messrs. GARTONS. The plants they have so far given the most attention to have been some of those, which it is fair to assume, have remained longest in cultivation, and a few that cannot be traced far back in the past. It is as yet difficult to see in which department they meet with most success, for in every instance the results are so astonishing that one simply remains astounded. Wheats, oats, barleys, roots, clovers, grasses are all alike simply bewildering, or, if taken in the order in which written, each one in turn is more surprising than its predecessor.

It is impossible in a short notice to give even an outline of the colossal and marvellous work done on this farm. Were it an experiment ground of a big university, it would deserve world wide credit for unending toil of a staff of professors and many students. As to the results, if looked at solely from a sordid standpoint, and only the commercial advantages noted, they are of national importance. It has always been claimed that a man is a benefactor to his race who causes two blades of grass to grow where one only stood before. To double the productiveness of a crop is tantamount to doubling the cultivable area of a country, looked at on the narrowest basis. But in reality it means

Gartons Seed Grounds—*continued.*

much more. Much of the cost of production of every crop is an inevitable outlay. Only a small addition to the total produce can turn the scale between lucrative trading or ruin, or, again, in many seasons a whole crop is irretrievably ruined from one minor defect that cannot resist some climatic condition that only rarely occurs. When it happens, however, loss is certain. Some most excellent types of wheat need stronger straw. This Messrs. GARTONS will give absolutely as asked. Oats are capable of much better modes of branching. This is secured to the extent that now some of GARTONS new varieties have seventeen seeds to one spikelet.

Barley is one of the plants that has naturally six rows of spikelets. The Chevalier and other two-row types have produced the two rows to the neglect of the remaining four, with consequent loss and disadvantage. Scientifically it is more useful to grow a six-row grain if the quality can be as good. Hitherto the appearance of bere and bigg has been against their acceptance by maltsters and brewers. Now GARTONS have a six-row type that leaves very little to be desired, and instead of yielding only four quarters per acre will give nine or ten quarters.

With roots the need to secure a combination of the character of, say, swedes, white turnips, and kohlrabi is of supreme importance. Yet this is done, and ere long our farmers will be in possession of new varieties of the utmost utility. With the clovers even more remarkable results are now assured, and it is only a question of time to work up the stocks sufficiently. Then agriculture will reap the benefits derivable from Messrs. GARTONS skill and patience. With the grasses the new varieties possible are legion. Already crossing fescues with loliums yields new breeds of much utility and value. Although Messrs. GARTONS have been working for twenty years, much more remains to be found out, but they have shown the way. Already Messrs. GARTONS have built up a large business, and it deserves to be still larger. There is every reason to feel assured it soon will be.

One feature in the case is a matter of which they may justly complain. Government and the more important agricultural bodies gives them little practical encouragement and no pecuniary aid. Yet rivals and imitators can deprive them of any advantage their work should bring after they have once parted with a bushel of new stock. One of the visitors on Thursday was much impressed with this, contrasting it with the way some Continental Governments reward research. This was Herr A. de Gijorgy, Agricultural Adviser to the Royal Hungarian Government."—Vide *Mark Lane Express*, July 22nd.



CROSSING TO PRODUCE NEW BREEDS OF WHEATS.



TAKING NOTES OF THE CHARACTERS OF THE SELECTED PLANTS OF NEW BREEDS OF WHEATS.



SOWING TRIAL PLOTS OF NEW BREEDS OF WHEATS, WINTER OATS,
AND WINTER BARLEYS.



TRIAL ROWS FROM SELECTED PLANTS OF THE NEW BREEDS OF WHEATS.



TESTING NEW BREEDS OF WHEATS FOR YIELD, VIGOUR, DISEASE RESISTANCE, AND QUALITY OF GRAIN.



SOWING LARGE FIELD TRIAL PLOTS OF CEREALS, FOR FINAL TESTS FOR YIELD, VIGOUR, AND
QUALITY OF GRAIN, BEFORE GROWING FOR INTRODUCTION.



FINAL FIELD TESTS OF NEW BREEDS OF WHEATS, FOR YIELD, VIGOUR, AND QUALITY
OF GRAIN, BEFORE GROWING FOR INTRODUCTION.



TAKING NOTES OF THE CHARACTERS OF NEW BREEDS OF WHEATS.



PICKING OUT MIXED PLANTS FROM STOCKS OF NEW BREEDS OF WHEATS BEFORE HARVESTING.



HARVESTING THE LARGE FIELD TRIAL PLOTS OF NEW BREEDS OF CEREALS.



HARVESTING A FIELD CROP OF A NEW BREED OF OAT.



HARVESTING A FIELD CROP OF A NEW BREED OF WHEAT, AND PICKING OUT THE MIXED EARS DURING THE CUTTING OF THE CROP.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE, CHESHIRE AND NORTH WALES
AT MESSRS. GARTONS EXPERIMENT GROUNDS.



MEMBERS OF THE MID-CHESHIRE FARMERS' ASSOCIATION AT MESSRS. GARTONS
EXPERIMENT GROUNDS.

Science and Agriculture.

SCIENCE has done much for agriculture, and ought to do still more. For example, take the question of seed-corn. In the past very little attention has been paid to the matter, and yet it is of the utmost importance. At Cockle Park, the farm let for demonstrative purposes to the Northumberland County Council by the Duke of Portland, Professor Somerville tried certain experiments with oats that we should like to see extended to all kinds of grain. He took a number of plots of strong clay loam and sowed them with oats, for the purpose of comparing the results of several varieties. Each plot, it should be added, was top-dressed with $1\frac{1}{4}$ cwt. of sulphate of ammonia and 2 cwt. superphosphate. The difference in the yield was truly remarkable. Bavarian oats gave $30\frac{1}{2}$ bushels of grain and 17 cwt. of straw per acre, Scotch white oats 38 bushels of grain and 24 cwt. of straw, but a new unnamed white oat of GARTONS gave 56 bushels of grain and 34 cwt. of straw. This result speaks for itself, and we believe it is the first occasion on which the new oats of the Messrs. GARTONS have been subjected to such a test. It will be more interesting to try all their seeds in the same way. Professor Somerville will not be able to carry on the experiment at Cockle Park, as he has accepted a Professorship at Cambridge, but it may be hoped that his successor will not fail to carry on so promising a work. The improvement in oats was effected by crossing with the wild oat grass of China, and the greater yield is due to the fact that the new breed produces ten or twelve grains where originally only two or three were produced. By further crossing with the indigenous wild oat a hardy plant has been obtained, quite suitable for early autumn sowing. In wheat a very similar process has been applied. *Triticum spelta*, the indigenous wild wheat of Southern Asia, has been crossed with our cultivated varieties, and the resulting cross is said to be a very fine wheat that ripens early, and does not readily shed its grain in wind. Improvements of equal importance have been effected in barleys and also in grains. Sir John Bennet Lawes gives the result of scientific test as well as a life-long experience when he says that very high farming is not profitable under present circumstances. It is a very different matter, however, if better returns can be obtained by the use of new breeds of cereals or forage plants that have been discovered only after long years of patient trial and research. The Messrs. GARTON have been pioneers in this new field of agricultural study, but no doubt they will have many followers, and the prudent farmer will not be slow to take full advantage of such discoveries.—*Vide "Country Life Illustrated."*

Gartons Museum of Seeds.

MESSRS. GARTONS have a most interesting stand, at which they exhibit a large selection of cross-fertilised Grain and Grasses, the ears of the cross-fertilised Grain being particularly large and prolific. Messrs. GARTONS museum of distinct new breeds of Farm Seeds is proving the sensation of the Agricultural Shows this season. At the Bath and West Show a special Council inspection was made, and at the Royal Counties Show at Windsor the same honour was accorded Messrs. GARTONS by the full Council, who afterwards brought the marvellous results to the notice of H.R.H. Prince Christian, who paid a visit to Messrs. GARTONS stand, and expressed his surprise and pleasure at the wonderful results obtained by the cross-fertilisation of seeds. The production and selection of the most prolific varieties of Grain is a sure way of making the growing of Grain profitable, and the Messrs. GARTON are doing a great work in that direction.—*North British Agriculturist*, June 21st.

Plant Breeding.

THE exhibits and demonstrations by Messrs. GARTONS at the recent Agricultural Shows at Windsor and Maidstone, illustrating the results of systematic experiments in the cross fertilisation of cereals and grasses, are not only of great scientific interest, but also give promise of great practical utility. Their results with cereals have been so successful that distinct permanent types of Barleys, Oats, and Wheats, greatly superior in quality and vigorous growth, have been produced, and for the last few years they have been experimenting on grasses, with results equally promising. These latter experiments were commenced on the leguminous plants, Beans being selected for the first series of experiments, and more recently Clovers and Grasses. The greatest care is necessary in the artificial fertilisation, for the anthers must be removed, extraneous pollen must be applied, and in doing so a certain amount of mutilation is necessary, but the success or failure depends very largely upon the skill with which the operation is conducted. The first three or four crosses are rarely permanent, and it is only after repeated selections and crosses that a permanent type is obtained. By a series of selections, crossing those varieties which show strength in the required direction, what may be regarded as distinct new breeds of varieties of plants have been produced, stated in some cases to give a yield of over 50 per cent. over the old varieties.—“*Daily Chronicle*,” June 30th.



CROSSING TO PRODUCE NEW BREEDS OF GRASSES.



STOCK PLANTS OF NEW BREEDS OF GRASSES.



PLANTING OUT NEW BREEDS OF GRASSES FOR SELECTION (AUTUMN).



TAKING NOTES OF THE CHARACTERS OF THE SELECTED PLANTS OF NEW BREEDS OF GRASSES.



TESTING THE MERITS OF SELECTED PLANTS OF NEW BREEDS OF GRASSES.



CROSSING THE SELECTED PLANTS OF NEW BREEDS OF GRASSES.



SOWING TRIAL LOTS OF SELECTED NEW BREEDS OF RYEGRASSES.



TESTING SELECTIONS FROM NEW BREEDS OF RYEGRASSES.



TESTING THE FORAGE GROWTH OF NEW BREEDS OF GRASSES (FESCUE AND RYEGRASS CROSSES).
THIS SHOWS THE STAGE OF GROWTH IN MAY.



COMPARATIVE TESTS OF NEW BREEDS OF PERENNIAL RYEGRASS. THE TENTH ROW FROM THE LEFT IS THE OLD VARIETY OF PERENNIAL RYEGRASS SOWN FOR COMPARISON



MAKING FINAL FIELD TESTS OF NEW BREEDS OF PERENNIAL RYEGRASS, TO TEST FOR FORAGE YIELD, BEFORE GROWING FOR INTRODUCTION. THE CENTRE PLOT IS THE OLD VARIETY OF PERENNIAL RYEGRASS, SOWN FOR COMPARISON.



TAKING NOTES OF THE CHARACTERS OF NEW BREEDS OF GRASSES DURING GROWTH.



TESTING BY WEIGHT THE FORAGE YIELDS OF NEW BREEDS OF GRASSES.



HARVESTING THE SELECTED TRIAL LOTS OF NEW BREEDS OF RYEGRASSES. EACH ROW REPRESENTS A NEW BREED UNDER TRIAL.



THRESHING SELECTED TRIAL LOTS OF NEW BREEDS OF GRASSES.



PICKING OUT WEED GRASSES FROM A FIELD CROP OF A NEW BREED OF
RYEGRASS BEFORE HARVESTING.



HARVESTING FIELD PLOTS OF STOCK SEED OF NEW BREEDS OF GRASSES.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE AND CHESHIRE AT
MESSRS. GARTONS EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM BEDFORDSHIRE AND HERTFORDSHIRE AT
MESSRS. GARTONS EXPERIMENT GROUNDS.

Resolution passed by a Deputation of Agriculturists from Northamptonshire at Newton-le-Willows.

"We have pleasure in bearing testimony to the valuable work you are carrying on at Newton-le-Willows, in the production of New Breeds of Farm Plants. In our visit to-day our expectations were more than realised, as we had no idea the work was carried on on such a large scale. Not only were we deeply impressed with the New Breeds of Cereals you have still to send out, but your New Breeds of Grasses and Clovers have all the appearances of being as great an advancement upon the existing varieties, as your New Breeds of Oats, Barleys, and Wheats have been over the old varieties of these."

Signed on behalf of the Deputation,

COLIN CAMPBELL, (*Chairman*), *July*.

Resolution passed by a Deputation of Agriculturists from Staffordshire at Newton-le-Willows.

"We, the undersigned, who have visited your Experimental Grounds to-day, desire to record our appreciation of the valuable work which you are carrying on in the improvements of Farm Plants. It is only by visiting these Grounds that Agriculturists can realise the importance of your work for the benefit of Agriculture. We were especially impressed with the New Breeds of Grasses and Clovers, these being so very superior to the old varieties which we have hitherto cultivated."

Signed on behalf of the Deputation,

WILLIAM H. HILL, (*Chairman*), *July*.

Resolution passed by a Deputation of Agriculturists from Cheshire at Newton-le-Willows.

"We cannot let this opportunity pass without expressing our high appreciation of the valuable Agricultural research work it has been our pleasure to inspect to-day at the Agricultural Experiment Grounds of Messrs. Gartons at Newton-le-Willows. From what we had previously heard of the work we were quite prepared to see some wonderful developments, and in this we have not been disappointed. Even after inspection one can scarcely realise the important changes which have been brought about; particularly noticeable were these changes in the new Breeds of Grasses and Clovers, and it is the unanimous opinion of this deputation of Farmers that the Messrs. Gartons are to be highly congratulated upon their achievements in the interest of Agriculture."

Signed on behalf of the Deputation,

JOHN HOBSON, (*Chairman*), July 31st.

Resolution passed by a Deputation of Agriculturists from Worcestershire at the Experiment Grounds, Newton-le-Willows.

"Having been accorded the privilege of inspecting your Experimental Seed Grounds at Newton-le-Willows, we are desirous of bearing testimony to the valuable work you are engaged upon in the raising of New Breeds of Cereals, Grasses, Clovers, and other Farm Plants. To Agriculturists the value of these over the old Breeds is of inestimable value, and we hope you will meet with that success which your efforts so well deserve."

Signed on behalf of the Deputation,

JOHN HANKINSON, (*Chairman*), July 26th.



CROSSING TO PRODUCE NEW BREEDS OF CLOVERS.



PLANTING OUT THE SELECTED PLANTS OF NEW BREEDS OF CLOVERS.



TESTING THE MERITS OF SELECTED PLANTS OF NEW BREEDS OF CLOVERS.



HARVESTING THE SEED OF SELECTED PLANTS OF NEW BREEDS OF CLOVERS.



CROSSING SELECTED PLANTS OF NEW BREEDS OF CLOVERS.



VIEW OF TRIAL PLOTS OF NEW BREEDS OF CLOVERS AND GRASSES.



SMALL TRIAL PLOTS OF NEW BREEDS OF CLOVERS TO TEST FOR YIELD AND QUALITY.



CUTTING AND TESTING BY WEIGHT THE GREEN FORAGE YIELD OF SMALL TRIAL PLOTS OF
NEW BREEDS OF CLOVERS.



SUN DRYING THE SMALL TRIAL PLOTS OF NEW BREEDS OF CLOVERS.



TESTING BY WEIGHT THE DRY FORAGE YIELD OF SMALL TRIAL PLOTS
OF NEW BREEDS OF CLOVERS AFTER MAKING INTO HAY.



TESTING THE PERENNIAL CHARACTER OF NEW BREEDS OF CLOVERS.





THRESHING THE SELECTED TRIAL LOTS OF NEW BREEDS OF CLOVERS.



SOWING TRIAL PLOTS OF NEW BREEDS OF CLOVERS TO TEST FOR YIELD AND QUALITY.



FIELD TRIAL PLOTS OF NEW BREEDS OF CLOVERS TO TEST THE YIELD AND QUALITY.



REPRESENTATIVE AGRICULTURISTS FROM CHESHIRE AT MESSRS. GARTONS EXPERIMENT GROUNDS.



MEMBERS OF THE SHROPSHIRE CHAMBER OF AGRICULTURE AT MESSRS. GARTONS EXPERIMENT GROUNDS.



CROSSING NEW BREEDS OF TURNIPS.



PLANTING OUT THE SELECTED BULBS OF NEW BREEDS OF TURNIPS.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE AND WORCESTERSHIRE AT MESSRS. GARTONS
EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM NORTH LANCASHIRE AT MESSRS. GARTONS EXPERIMENT GROUNDS.



A PARTY OF SCOTTISH AGRICULTURISTS AT MESSRS. GARTONS EXPERIMENT GROUNDS.



CROSSING NEW BREEDS OF MANGELS.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE AND LINCOLNSHIRE AT MESSRS. GARTONS
EXPERIMENT GROUNDS.



REPRESENTATIVE AGRICULTURISTS FROM LANCASHIRE AT MESSRS. GARTONS EXPERIMENT GROUNDS.



TAKING PHOTO-MICROGRAPHS OF THE ORGANS OF PLANTS FOR DEMONSTRATIVE PURPOSES

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